

Specification of Competency Standards
for the Testing, Inspection and Certification Industry
Unit of Competency

Functional Area - Testing Operations

Title	Perform electromagnetic compatibility (immunity) tests
Code	105819L5
Range	This unit of competency (UoC) covers the abilities to carry out suitable immunity tests on electrical and electronic products independently and evaluate test results critically by applying the knowledge of electromagnetic compatibility in testing laboratories.
Level	5
Credit	8 (For Reference Only)
Competency	<p>Performance Requirements</p> <p>1. Possess knowledge of electromagnetic compatibility and related immunity tests</p> <ul style="list-style-type: none"> • Employ the principles of electromagnetic compatibility (EMC). • Employ the principles of immunity tests, e.g. electrostatic discharge (ESD), conducted immunity, radiated immunity, fast transient burst, surge, harmonic and voltage fluctuation immunity, magnetic field immunity. • Explain the methods of measurements for immunity tests. • Specify the requirements of immunity tests related to selected electrical and electronic products. • Identify relevant categories of EMC standards, e.g.: <ul style="list-style-type: none"> ○ basic/generic standards, product family standards, ○ international, national and industrial standards such as IEC, CISPR, EN, ANSI, ETSI, GB, FCC, IEEE, AS/NZS. • Explain the principles and operation of instruments used for the immunity tests, e.g. uniformity test of fully anechoic chamber, surge and burst generator, coupler/decoupler network, capacitive coupling clamp, test bench, electrostatic discharge gun, artificial hand. • Employ the basic mathematical concepts, e.g. decibel usage, linear scale, log scale, units in the measurement. • Apply the concepts of uncertainty and instrument calibration to the immunity tests. <p>2. Perform electromagnetic compatibility (immunity) tests</p> <ul style="list-style-type: none"> • Select appropriate test methods/standards, test plans, test conditions, accessories, loading and simulation of normal operations for immunity tests. • Select appropriate testing instrument and test site for the measurements. • Apply appropriate conditions to the testing instrument, e.g.: <ul style="list-style-type: none"> ○ test levels of the instrument such as ESD voltage for both air and contact electrostatic discharge, field immunity levels for radio frequency electromagnetic fields, ○ rise time/hold time and repetition frequency for fast transient burst, ○ test waveform characteristics such as rise time, pulse duration, repetition frequency, test modulation, number of dips, period of voltage fluctuations. • Apply appropriate conditions to the sample under test, e.g.: <ul style="list-style-type: none"> ○ normal operating conditions specified in product standards such as wiring arrangement, required simulation accessories, environmental conditions, ○ input and output to enclosure parts such as supply voltage, loading conditions. • Carry out immunity measurements independently according to the test methods/standards. • Carry out required validation checks to confirm the system and instrumental requirements such as site validation, differential voltages of surge probes are met. • Record accurate test data, configuration and conditions, and evaluate test results critically by exercising appropriate judgement.

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	<p>3. Exhibit professionalism</p> <ul style="list-style-type: none">• Ensure all measurements are carried out in compliance with good industry practices and relevant categories of standards.• Ensure all measurements comply with the uncertainty and calibration requirements for a testing laboratory.
Assessment Criteria	<p>The integrated outcome requirements of this UoC are the abilities to:</p> <ul style="list-style-type: none">• apply appropriate conditions to the testing instrument and the electrical and electronic product under the immunity test,• carry out the immunity test independently and safely to record accurate data according to the requirements of relevant test methods/standards,• evaluate test results critically by exercising appropriate judgement to confirm the compliance of electromagnetic compatibility (immunity) of the product against the relevant specifications of test methods/standards.
Remark	